THE CLAIMS

I claim:

1. A multiphase translation system including a first linear switched reluctance machine ("LSRM") having a stator and a translator configured, positioned and proportioned for, electromagnetic engagement with each other, the system comprising:

   (a) means for selectable application of at least one phase of a multi-phase DC excitation to said LSRM to thereby produce a longitudinal and a normal force between said stator and said translator; and

   (b) means for substantially simultaneous application of at least two phases of said multi-phase excitation to said LSRM to thereby produce a selectable normal force between said stator and translator.

2. The system as recited in Claim 1 further comprising:

   (c) means for independent control of each of said excitations of said means (a) and (b) above.

3. The system as recited in Claim 2 in which said translator comprises: eight poles and windings of four phases.

4. The system as recited in Claim 2, further comprising:

(d) means for measurement of an absolute position of said translator relative to said stator.

5. The system as recited in Claim 4, further comprising:

(e) means for measurement of currents associated with each phase of said multi-phase excitation.

6. The system as recited in Claim 5, further comprising:

(f) means for establishing command values for currents associated with each phase of said multi-phase excitation producing said longitudinal force;

(g) means for comparing said currents to respective command values thereof to produce respective error values; and

(h) means for monitoring said error values.

7. The system as recited in Claim 6, further comprising:

(i) means for applying said respective error values to a carrier signal; and

(j) means for applying respective error values of said signal to respective phases of said excitation current of said LSRM.

8. system as recited in Claim 5, further comprising:

(k) a plurality of PROMS for continual storage of dynamic values of translator position and each phase current associated therewith;

(l) for each PROM, means for storage of propulsive force values as a function of each of said dynamic values stored in each PROM; and

(m) means for summing said propulsive forces.

9. The system as recited in Claim 8, further comprising:

(n) for each PROM, means for storage of levitation force values associated with said normal force; and

(o) means for summing said levitation forces.

10. The system as recited in Claim 9, further comprising:

means for establishing command values for currents associated with each phase of said multi-phase excitation producing said longitudinal force;

means for comparing said currents to respective command values thereof to produce respective error values; and

means for monitoring said error values.

11. The system as recited in Claim 10, further comprising:

means for applying said respective error values to a carrier signal; and

means for applying respective error values of said signal to respective phases of said excitation current of said LSRM.

12. The system as recited in Claim 7, further comprising:

means for dynamically compensating for out-of-limit error values.

13. The system as recited in Claim 11, further comprising:

means for dynamically compensating for out-of-limit error values.

14. The system as recited in Claim 7, further comprising:

a second LSRM, said LSRM in electromagnetic engagement with said first LSRM, having means for DC multiphase excitation of a stator and translator thereof, to thereby produce a guidance force for said system using said error values of said second LSRM.

15. The system as recited in Claim 14 in which said second LSRM is in quadrature with said first LSRM.

16. The system as recited in Claim 15, further comprising:

means for dynamically compensating for out-of-limit error values

17. The system as recited in Claim 16, further comprising:

means for independent control of said guidance force of said second LSRM.

18. The system as recited in Claim 7, in which said translation system comprises:

a part of any of a transportation system, an elevator, a rocket launcher, an aircraft launcher, a rail gun, a conveyor, a door opener, a machine tool, or a servodrive.

19. The system as recited in Claim 18, further comprising:

a second LSRM, said LSRM in electromagnetic engagement with said first LSRM, having means for DC multiphase excitation of a stator and translator thereof, to thereby produce a guidance force for said system using said error values of second LSRM

20. The system as recited in Claim 19, in which either of said LSRM comprise a longitudinal or transverse flux type machine.